

the side of the sheath, which, by observing the Figure diligently, is easie enough to be perceiv'd; and from several particulars, I suppose the Animal has a power of displaying them, and shutting them in again as it pleases, as a Cat does its claws, or as an Adder or Viper can its teeth or fangs.

The other part of the Sting was the Sword, as I may so call it, which is sheath'd, as it were, in it, the top of which *ab* appears quite through at the smaller end, just as if the chape of the sheath of a Sword were lost, and the end of it appear'd beyond the Scabbard; the end of this Dart (*a*) was very sharp, and it was arm'd likewise with the like Tenterhooks or claws with those of the sheath, such as (*vxy*, *xyz*) these crooks, I am very apt to think, can be clos'd up also, or laid flat to the sides of the Sword when it is drawn into the Scabbard, as I have several times observ'd it to be, and can be spread again or extended when ever the Animal pleases.

The consideration of which very pretty structure, has hinted to me, that certainly the use of these claws seems to be very considerable, as to the main end of this Instrument, for the drawing in, and holding the sting in the flesh; for the point being very sharp, the top of the Sting or Dagger (*ab*) is very easily thrust into an Animal's body, which being once entred, the Bee, by endeavouring to pull it into the sheath, draws (by reason of the crooks (*vxy*) and (*xyz*) which lay hold of the skin on either side) the top of the sheath (*tfrv*) into the skin after it, and the crooks *t, s*, and *r, v*, being entred, when the Bee endeavours to thrust out the top of the sting out of the sheath again, they lay hold of the skin on either side, and so not onely keep the sheath from sliding back, but helps the top inwards, and thus, by an alternate and successive retracting and emitting of the Sting in and out of the sheath, the little enraged creature by degrees makes his revengfull weapon pierce the toughest and thickest Hides of his enemies, in so much that some few of these stout and resolute soldiers with these little engines, do often put to flight a huge mastie Bear, one of their deadly enemies, and thereby shew the world how much more considerable in Warr a few skilfull Engineers and resolute soldiers politickly order'd, that know how to manage such engines, are, then a vast unweildy rude force, that confides in, and acts onely by, its strength. But (to proceed) that he thus gets in his Sting into the skin, I conjecture, because, when I have observ'd this creature living, I have found it to move the Sting thus, to and fro, and thereby also, perhaps, does, as 'twere, pump or force out the poisonous liquor, and make it hang at the end of the sheath about *b* in a drop. The crooks, I suppose also to be the cause why these angry creatures, hastily removing themselves from their revenge, do often leave these weapons behind them, sheath'd, as 'twere, in the flesh, and, by that means, cause the painfull symptoms to be greater, and more lasting, which are very probably caus'd, partly by the piercing and tearing of the skin by the Sting, but chiefly by the corrosive and poisonous liquor that is by this Syringe-pipe convey'd among the sensitive parts thereof and thereby more easily gnaws and

and corrodes those tender fibres: As I have shewed in the description of a Nettle and of Cowhage.

Observ. XXXV. Of the contexture and shape of the particles of Feathers.

Examining several sorts of Feathers, I took notice of these particulars in all sorts of wing-Feathers, especially in those which serv'd for the beating of the air in the action of flying.

That the outward surface of the Quill and Stem was of a very hard, stiff, and horny substance, which is obvious enough, and that the part above the Quill was fill'd with a very white and light pith, and, with the Microscope, I found this pith to be nothing else, but a kind of natural congeries of small bubbles, the films of which seem to be of the same substance with that of the Quill, that is, of a stiff transparent horny substance.

Which particular seems to me, very worthy a more serious consideration; For here we may observe Nature, as 'twere, put to its shifts, to make a substance, which shall be both light enough, and very stiff and strong, without varying from its own establish'd principles, which we may observe to be such, that very strong bodies are for the most part very heavie also, a strength of the parts usually requiring a density, and a density a gravity; and therefore should Nature have made a body so broad and so strong as a Feather, almost, any other way then what it has taken, the gravity of it must necessarily have many times exceeded this; for this pith seems to be like so many stops or cross pieces in a long optical tube, which do very much contribute to the strength of the whole, the pores of which were such, as that they seem'd not to have any communication with one another, as I have elsewhere hinted.

But the Mechanism of Nature is usually so excellent, that one and the same substance is adapted to serve for many ends. For the chief use of this, indeed, seems to be for the supply of nourishment to the downy or feathery part of the stem; for 'tis obvious enough in all sorts of Feathers, that 'tis plac'd just under the roots of the branches that grow out of either side of the quill or stalk, and is exactly shap'd according to the ranking of those branches, coming no lower into the quill, then just the beginning of the downy branches, and growing onely on the under side of of the quill where those branches do so. Now, in a ripe Feather (as one may call it) it seems difficult to conceive how the *succus nutritius* should be convey'd to this pith; for it cannot, I think, be well imagin'd to pass through the substance of the quill, since, having examin'd it with the greatest diligence I was able, I could not find the least appearance of pores; but he that shall well examine an unripe or pinn'd Feather, will plainly enough perceive the Vessel for the conveyance of it to be the thin filmy pith (as 'tis call'd) which passes through the middle of the quill.

As for the make and contexture of the Down it self, it is indeed very rare